

## A

## Zone 1: codons 1 to 10

	1	2	3	4	5	6	7	8	9	10	
Library	RNT	NAS	RNT	NAS	NAS	NYC	RNT	RNA	RNT	RNT	(SEQ ID NO. 139)
	A	D	A	D	D	A	A	A	A	A	
	D	E	D	E	E	F	D	E	D	D	
	G	H	G	H	H	I	G	G	G	G	
	I	K	I	K	K	L	I	I	I	I	
	N	N	N	N	N	P	N	K	N	N	
wt	S	Q	S	Q	Q	S	S	R	S	S	
	T	Y	T	Y	Y	T	T	T	T	T	
	V		V			V	V	V	V	V	
	GCC	GAG	GGT	GAC	GAT	CCC	GCA	AAA	CCG	GCC	(SEQ ID NO. 140)
	A	E	G	D	D	P	A	K	A	A	(SEQ ID NO. 141)
1a	GAT	AAG	AGT	GAG	AAG	TTC	GCT	AGA	GAT	GCT	(SEQ ID NO. 142)
	D	K	S	E	K	F	A	R	D	A	(SEQ ID NO. 143)
1b	AAT	AAG	GAT	GAG	CAG	TTC	GCT	AGA	GCT	GCT	(SEQ ID NO. 144)
	I	K	D	E	Q	F	A	R	A	A	(SEQ ID NO. 145)
1c	ATT	TAC	ATT	AAG	GAG	ACC	AGT	AAA	AAT	GCT	(SEQ ID NO. 146)
	I	Y	I	K	E	T	S	K	N	A	(SEQ ID NO. 147)
1d	AAT	TAC	GTT	GAC	CAG	GTC	AGT	AAA	AAT	GCT	(SEQ ID NO. 148)
	N	Y	V	D	Q	V	S	K	N	A	(SEQ ID NO. 149)
1e	GCT	AAG	GCT	GAG	GAG	TTC	GCT	GAA	GCT	GCT	(SEQ ID NO. 150)
	A	K	A	E	E	F	A	E	A	A	(SEQ ID NO. 151)
1f	GCT	GAC	ATT	GAC	GAC	TTC	GCT	AGA	AGT	GCT	(SEQ ID NO. 152)
	A	D	I	D	D	F	A	R	S	A	(SEQ ID NO. 153)

Figure 1A

## B

## Zone 2: codons 11 to 20

L i b r a r y	11	12	13	14	15	16	17	18	19	20	(SEQ ID NO. 154)
	NWT	NAS	RNT	NYT	NAS	RNT	RNT	RNT	RNT	NAS	
	D	D	A	A	D	A	A	A	A	D	
	F	E	D	F	E	D	D	D	D	E	
	H	H	G	I	H	G	G	G	G	H	
	I	K	I	L	K	I	I	I	I	K	
	L	N	N	P	N	N	N	N	N	N	
	N	Q	S	S	Q	S	S	S	S	Q	
	V	Y	T	T	Y	T	T	T	T	Y	
	Y		V	V		V	V	V	V		
wt	TTT	AAC	TCC	CTG	CAA	GCC	TCA	GGG	ACC	GAA	(SEQ ID NO. 155)
	F	N	S	L	Q	A	S	A	T	E	(SEQ ID NO. 156)
2a	TAT	GAG	GCT	CTT	GAG	GAT	ATT	GCT	ACT	AAC	(SEQ ID NO. 157)
	Y	E	A	L	E	D	I	A	T	N	(SEQ ID NO. 158)
2b	TAT	GAG	GCT	CTT	GAG	GAT	ATT	GCT	ACT	AAC	(SEQ ID NO. 159)
	Y	E	A	L	E	D	I	A	T	N	(SEQ ID NO. 160)
2c	TAT	GAG	GCT	CTT	GAG	GAT	ATT	GCT	ACT	AAC	(SEQ ID NO. 161)
	Y	E	A	L	E	D	I	A	T	N	(SEQ ID NO. 162)
2d	TAT	GAC	GTT	CTT	CAG	ATT	GCT	GCT	ATT	AAC	(SEQ ID NO. 163)
	Y	D	V	L	Q	I	A	A	I	N	(SEQ ID NO. 164)
2e*	CTT	AAG	GAT	CTT	AAG	GCT	ACT	GTT	ATT	CAG	(SEQ ID NO. 165)
	L	K	D	L	K	A	T	V	I	Q	(SEQ ID NO. 166)
2f*	TAT	GAG	ACT	ATT	AAG	GAT	GAT	ATT	GTT	AAG	(SEQ ID NO. 167)
	Y	E	T	I	K	D	D	I	V	K	(SEQ ID NO. 168)
2g*	CTT	CAG	AAT	ATT	CAC	AGT	AGT	ATT	AGT	AAG	(SEQ ID NO. 169)
	L	Q	N	I	H	S	S	I	S	K	(SEQ ID NO. 170)
2h*	TAT	AAG	ACT	GTT	CAG	GGT	GCT	ATT	GCT	AAG	(SEQ ID NO. 171)
	Y	K	T	V	Q	G	A	I	A	K	(SEQ ID NO. 172)
2i*	TAT	AAG	ACT	ATT	AAG	AGT	ATT	GCT	AAT	AAG	(SEQ ID NO. 173)
	Y	K	T	I	K	S	I	A	N	K	(SEQ ID NO. 174)
2j*	TAT	TAG	AGT	CTT	CAG	ATT	ATT	GCT	GCT	CAG	(SEQ ID NO. 175)
	Y	Q	S	L	Q	I	I	A	A	Q	(SEQ ID NO. 176)
2k*	TTT	CAG	AGT	CTT	AAG	GAT	ACT	GCT	GAT	GAG	(SEQ ID NO. 177)
	F	Q	S	L	K	D	T	A	D	E	(SEQ ID NO. 178)
2m*	TTT	GAG	AAT	CTT	TAG	GCT	ACT	ATT	ACT	AAG	(SEQ ID NO. 179)
	F	E	N	L	Q	A	T	I	T	K	(SEQ ID NO. 180)

Figure 1B

## C

## Zone 3: codons 21 to 30

	21	22	23	24	25	26	27	28	29	30
	NWC	NWC	NKT	NWC	NYT	NKG	NYT	NKG	NWT	NWT (SEQ ID NO. 181)
L	D	D	C	D	A	G	A	G	D	D
i	F	F	F	F	F	L	F	L	F	F
b	H	H	G	H	I	M	I	M	H	H
r	I	I	I	I	L	R	L	R	I	I
a	L	L	L	L	P	V	P	V	L	L
r	N	N	R	N	S	W	S	W	N	N
y	V	V	S	V	T		T		V	V
	Y	Y	V	Y	V		V		Y	Y

wt	TAT	ATC	GGT	TAT	GGG	TGG	GGG	ATG	GTT	GTT (SEQ ID NO. 182)
	Y	I	G	Y	A	W	A	M	V	V (SEQ ID NO. 183)
3a	CTT	TTC	TTT	CTC	CTT	GGG	ACT	GTG	CAT	CTT (SEQ ID NO. 184)
	L	F	F	L	L	G	T	V	H	L (SEQ ID NO. 185)
3b	TAC	TAC	CTT	AAC	ATT	TTG	GCT	GTG	TAT	GTT (SEQ ID NO. 186)
	Y	Y	L	N	I	L	A	V	Y	V (SEQ ID NO. 187)
3c	TTC	ATC	CGT	GTC	ACT	TGG	ACT	ATG	TAT	GTT (SEQ ID NO. 188)
	F	I	R	V	T	W	T	M	Y	V (SEQ ID NO. 189)
3d	GTC	ATC	CGT	TAC	GTT	ATG	TCT	ATG	TAT	GTT (SEQ ID NO. 190)
	V	I	R	Y	V	M	S	M	Y	V (SEQ ID NO. 191)

Figure 1C

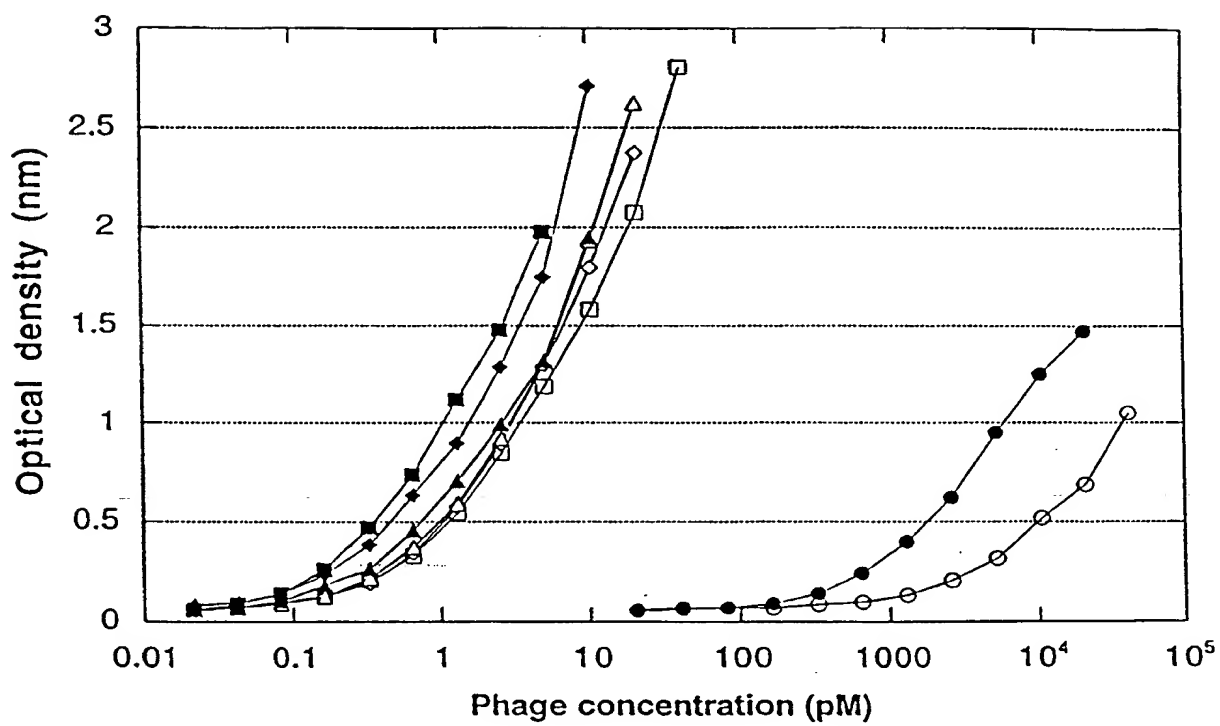


Figure 2

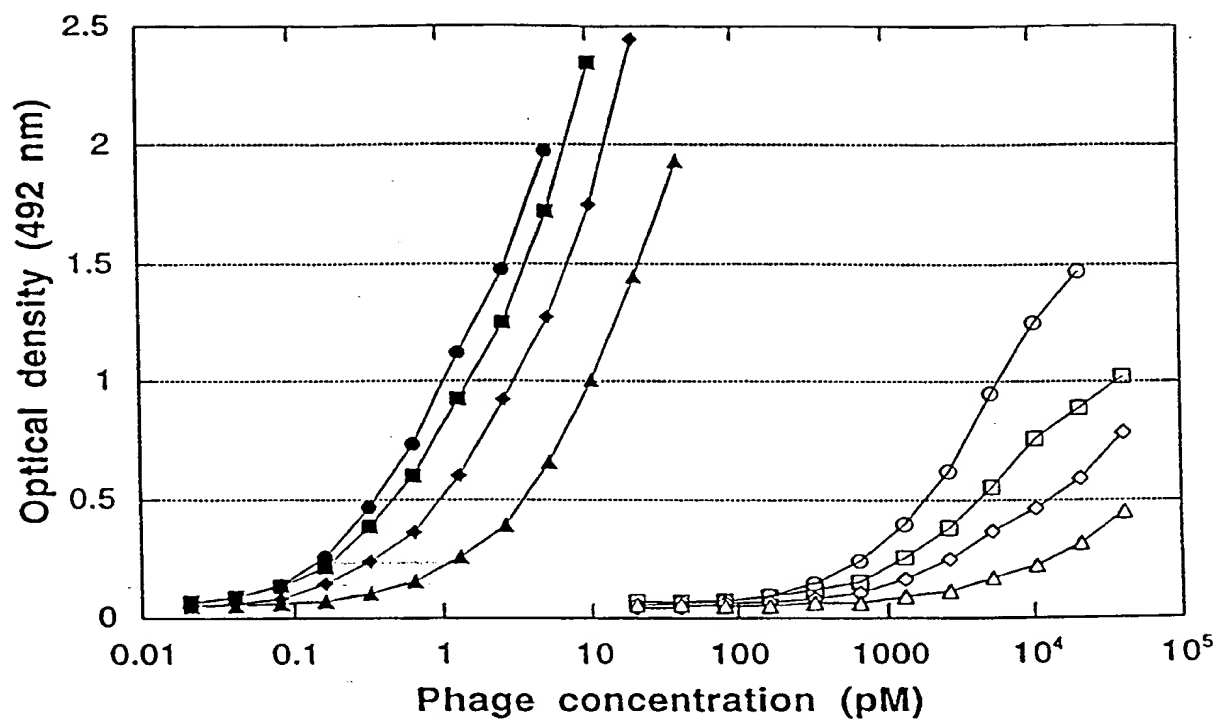


Figure 3

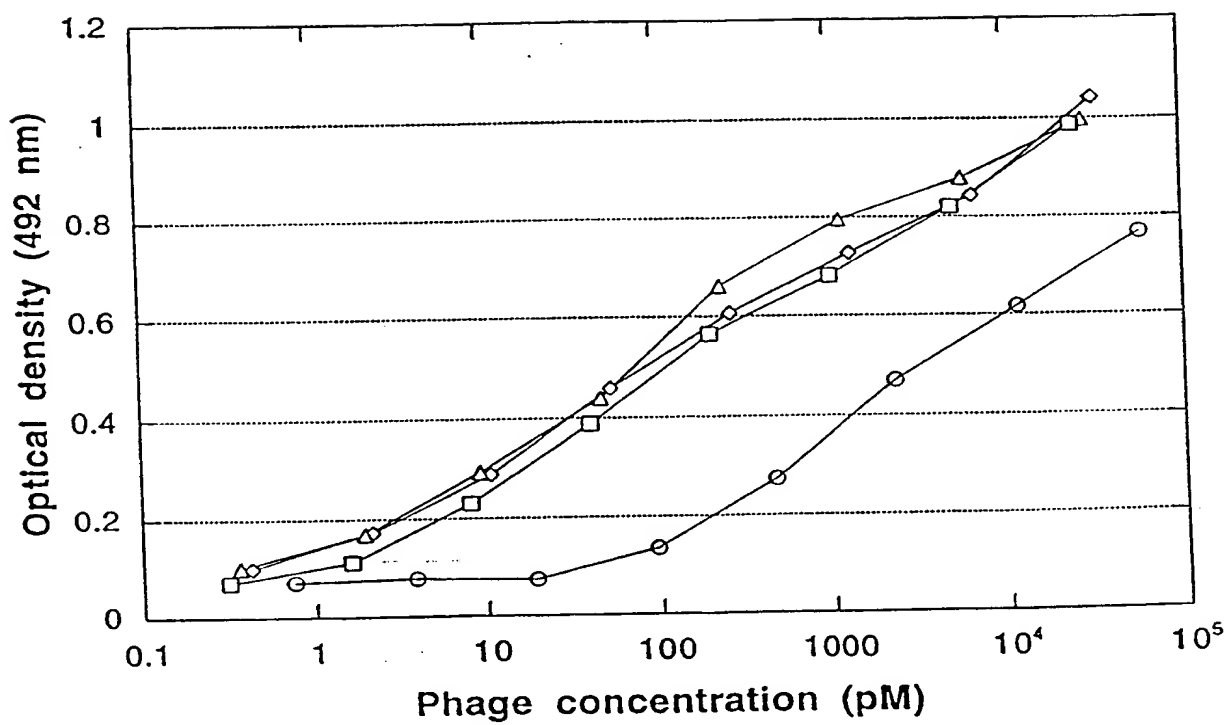


Figure 4A

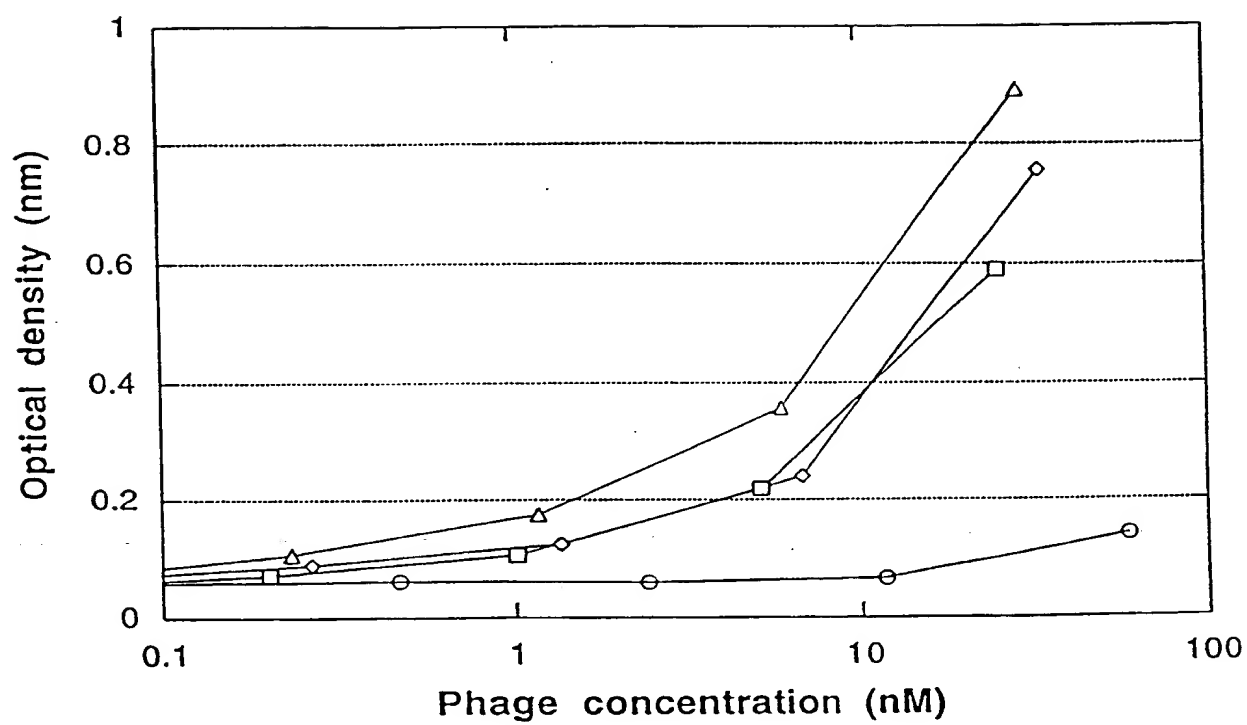


Figure 4B

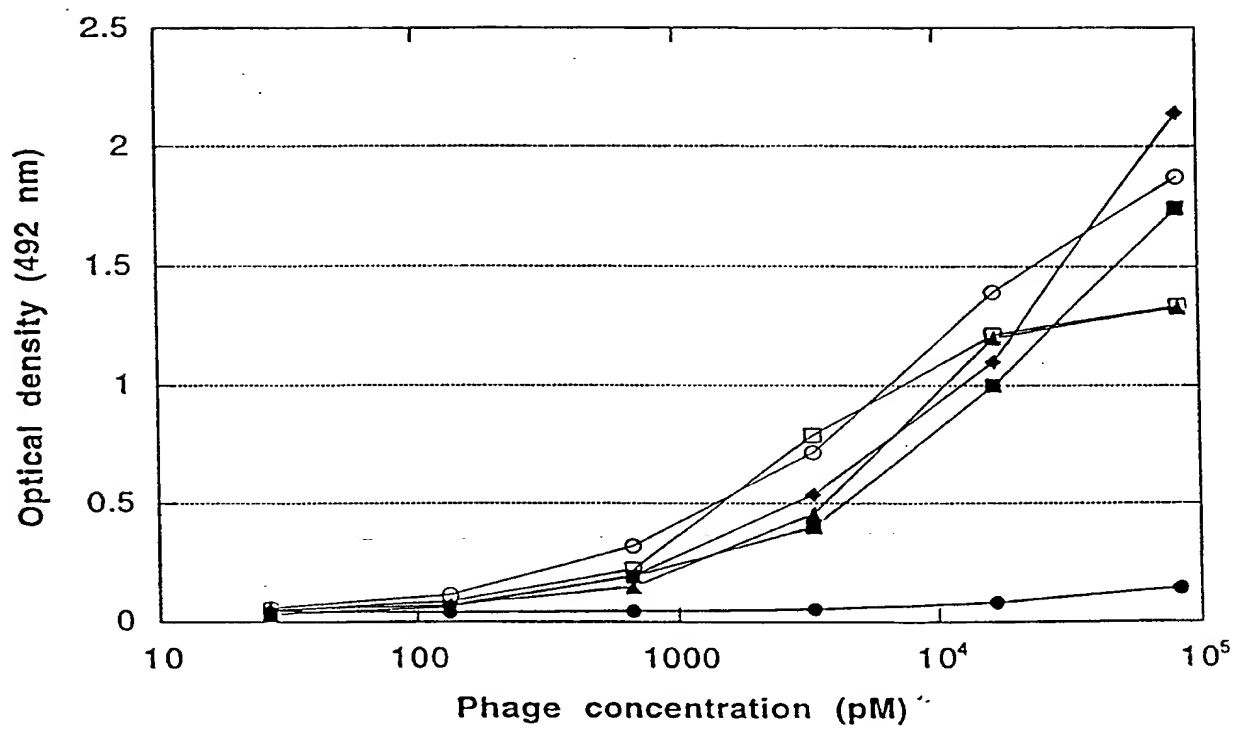


Figure 5



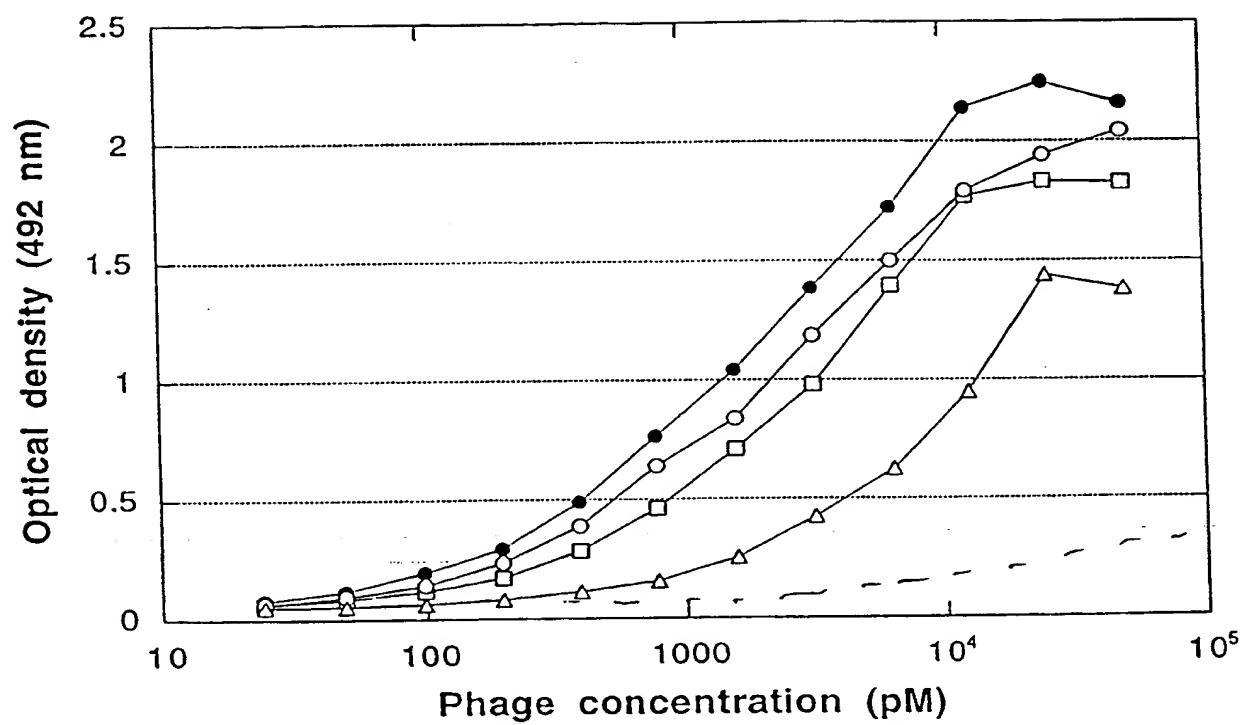


Figure 6

A

Link1	I GAC D T	2 ACC G A	3 AGC S R	4 AAC N CAC H	5 AGC S ACC A	6 ACC T AAC N	7 CAC H GAC D	8 ACC P AAC N	9 CAC H GAC D	10 ACC R ACC G	11 CAC H ACC A	12 AAC N CAC H	13 ACC R ACC R	14 ACC R ACC P	(SEQ ID NO. 192)
Link2	ACC T T	ACC A CAC H	ACC R ACC P	ACC H AAC N	ACC A ACC P	ACC N ACC R	ACC D AAC N	ACC N ACC A	ACC D ACC A	ACC G ACC G	ACC A ACC P	ACC H ACC A	ACC R ACC P	ACC R ACC G	(SEQ ID NO. 193)
Link3	ACC T T	ACC A CAC H	ACC R ACC P	ACC H AAC N	ACC A ACC P	ACC N ACC R	ACC D AAC N	ACC N ACC A	ACC D ACC A	ACC G ACC G	ACC A ACC P	ACC H ACC A	ACC R ACC P	ACC R ACC G	(SEQ ID NO. 194)
Link4	CAC H ACC T	ACC R ACC P	ACC N ACC P	ACC G AAC N	ACC T ACC P	ACC D ACC R	ACC P ACC A	ACC G ACC A	ACC G ACC A	ACC P ACC G	ACC R ACC P	ACC A ACC P	ACC R ACC P	ACC H ACC G	(SEQ ID NO. 195)
Link5	ACC A ACC T	ACC P ACC P	ACC R ACC P	ACC D AAC N	ACC T ACC P	ACC T ACC R	ACC A ACC A	ACC H ACC A	ACC R ACC A	ACC H ACC G	ACC T ACC P	ACC H ACC P	ACC R ACC P	ACC H ACC G	(SEQ ID NO. 196)
Link6	ACC P ACC T	ACC R ACC P	ACC S ACC P	ACC A AAC N	ACC R ACC P	ACC S ACC R	ACC R ACC A	ACC N ACC A	ACC T ACC A	ACC N ACC G	ACC D ACC P	ACC R ACC P	ACC H ACC P	ACC D ACC T	(SEQ ID NO. 197)
Link7	ACC T ACC G	ACC A ACC P	ACC P ACC P	ACC D AAC N	ACC R ACC P	ACC S ACC R	ACC S ACC A	ACC N ACC A	ACC D ACC A	ACC T ACC G	ACC H ACC P	ACC A ACC P	ACC R ACC P	ACC T ACC G	(SEQ ID NO. 198)
Link8	ACC G ACC G	ACC S ACC P	ACC P ACC P	ACC S AAC N	ACC R ACC P	ACC S ACC R	ACC S ACC A	ACC N ACC A	ACC D ACC A	ACC T ACC G	ACC H ACC P	ACC A ACC P	ACC R ACC P	ACC T ACC G	(SEQ ID NO. 199)
Link9	ACC G ACC G	ACC H ACC P	ACC A ACC P	ACC G AAC N	ACC H ACC P	ACC P ACC R	ACC H ACC A	ACC R ACC A	ACC P ACC A	ACC R ACC G	ACC H ACC P	ACC P ACC P	ACC A ACC P	ACC R ACC G	(SEQ ID NO. 200)

Figure 7A

B

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Link10	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Link11	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Link12	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Link13	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Link14	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Link15	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Link16	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Link17	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Link18	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Link19	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Link20	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Link21	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Link22	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Link23	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Link24	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Link25	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Link26	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Link27	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Link28	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19						

Figure 7B

PCT/US

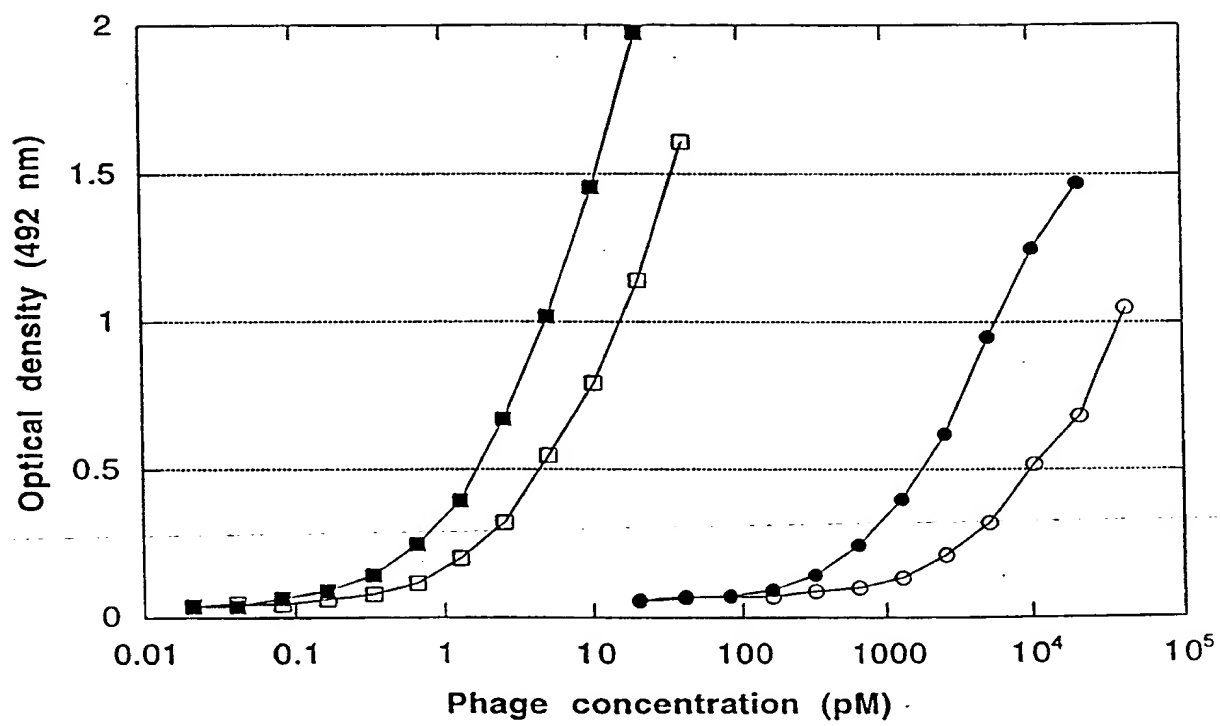


Figure 8A

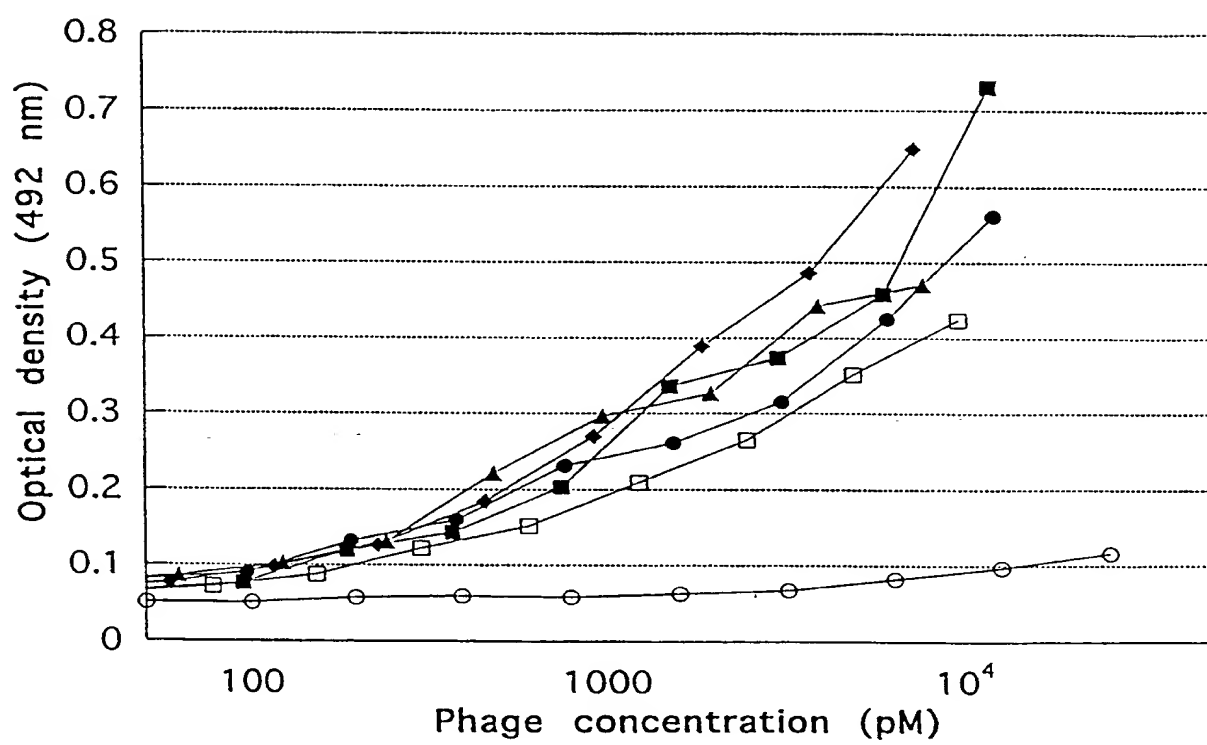


Figure 8B

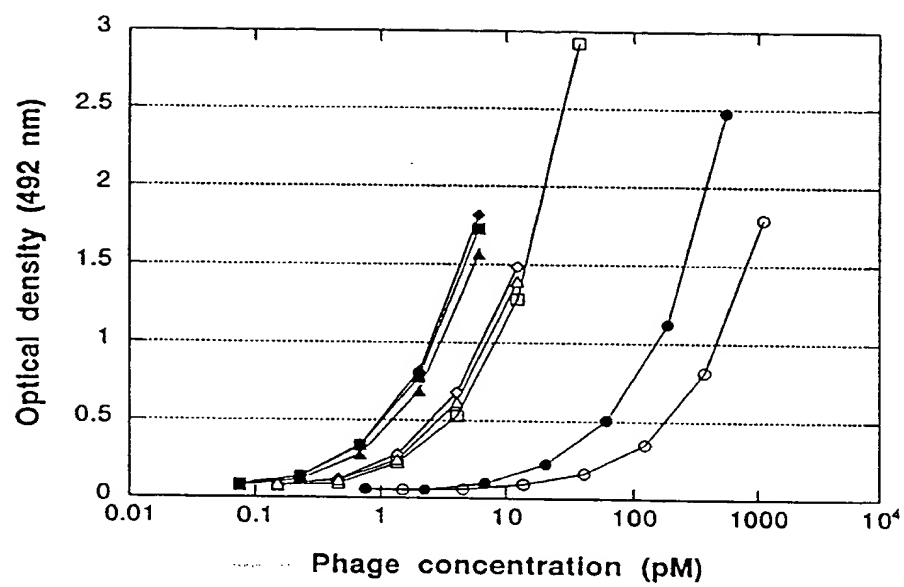


Figure 9

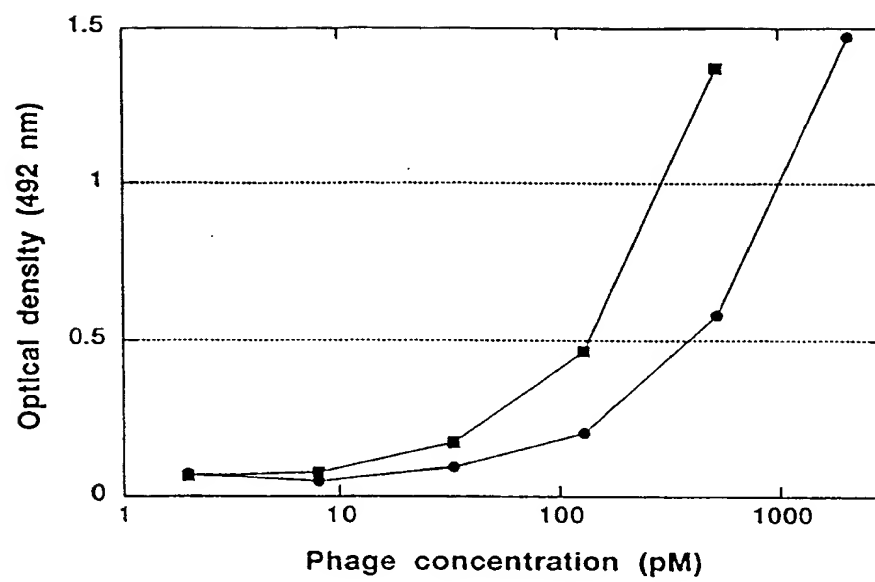


Figure 10

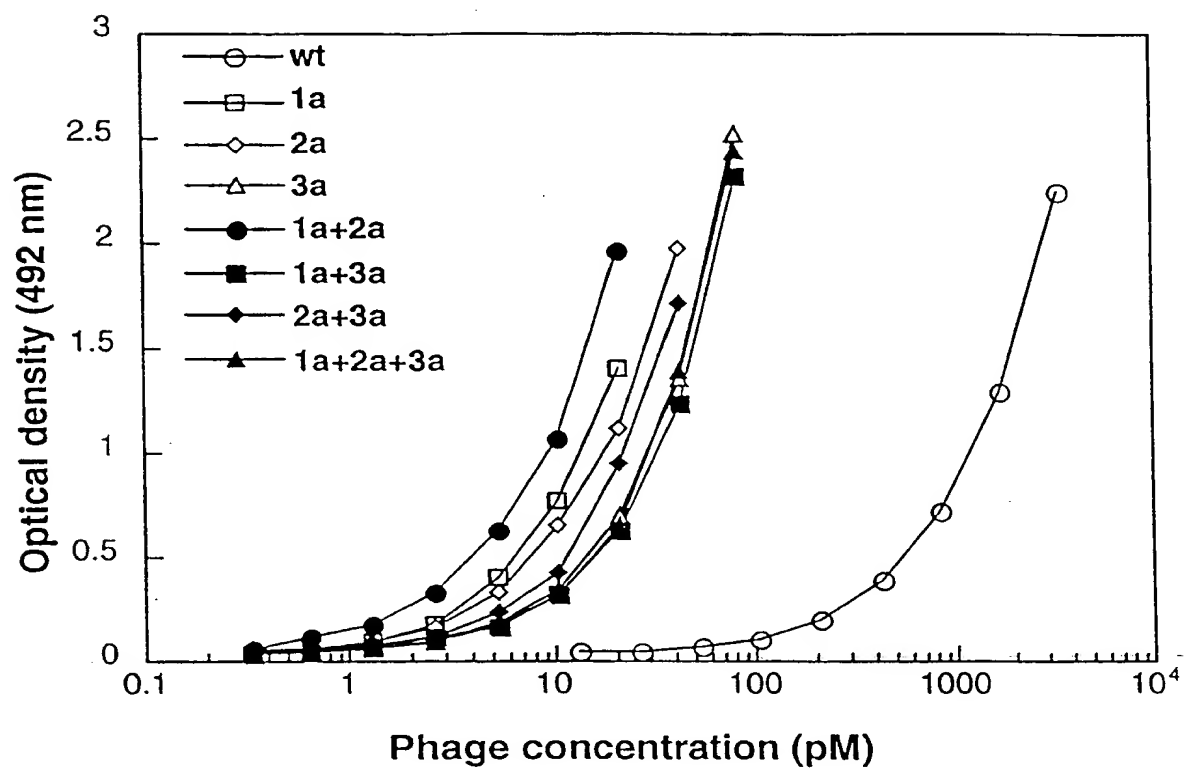


Figure 11



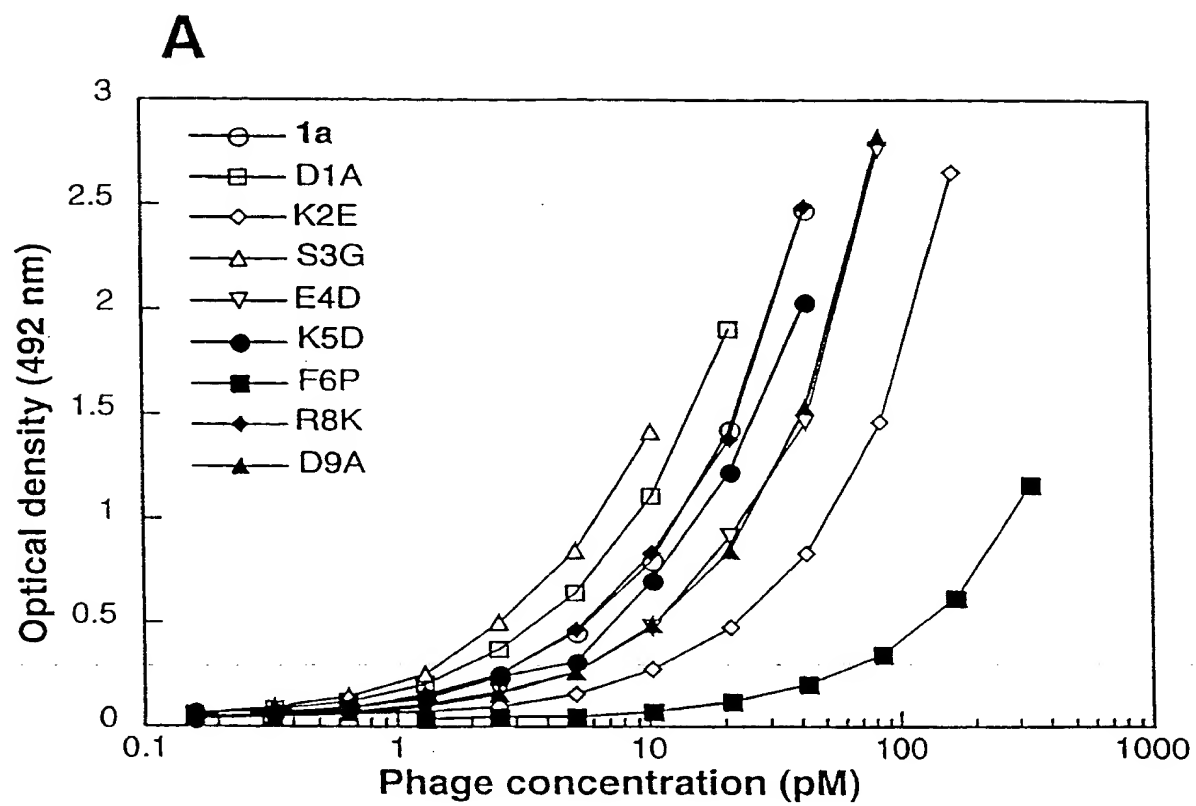


Figure 12A

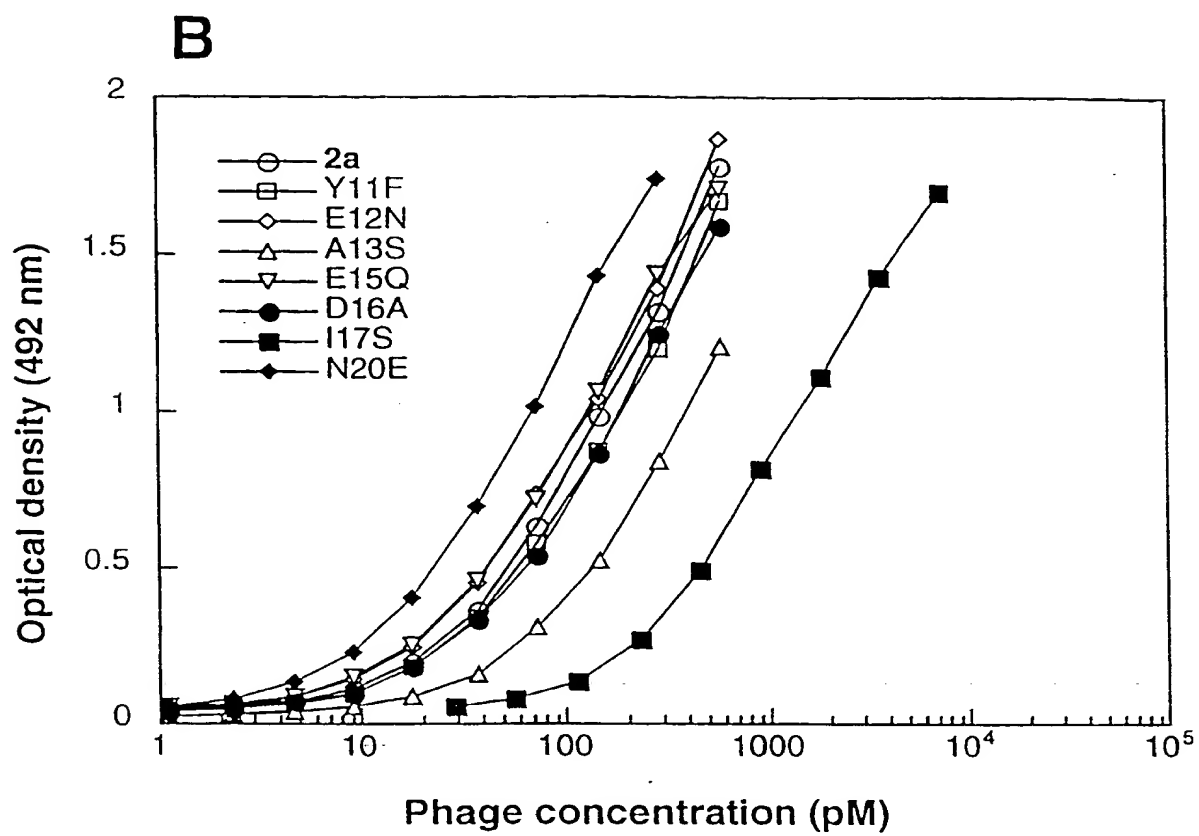


Figure 12B

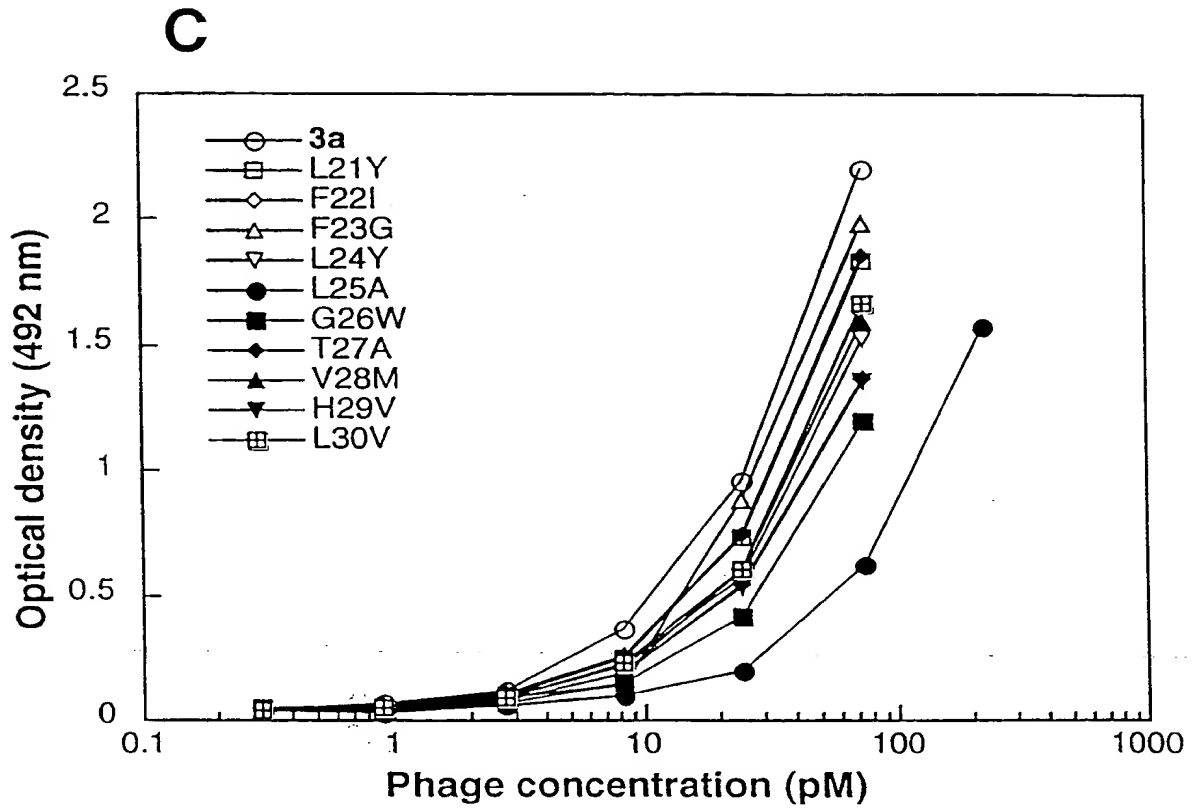


Figure 12C

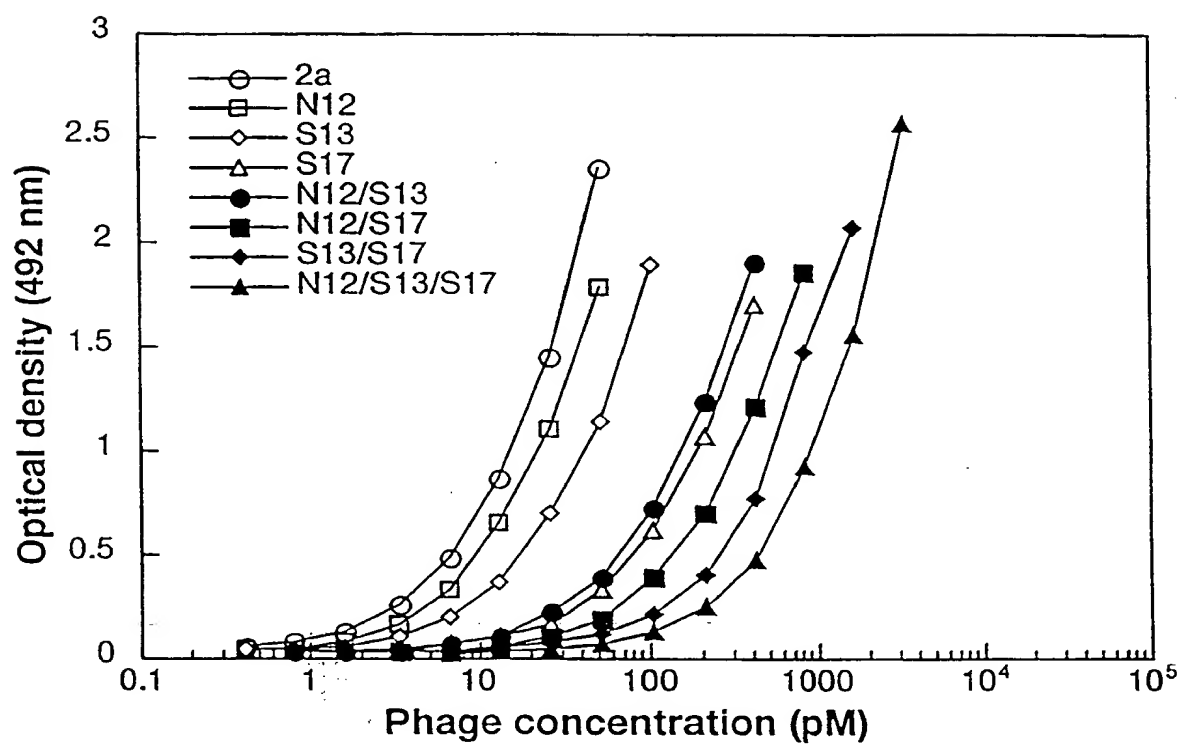


Figure 12D

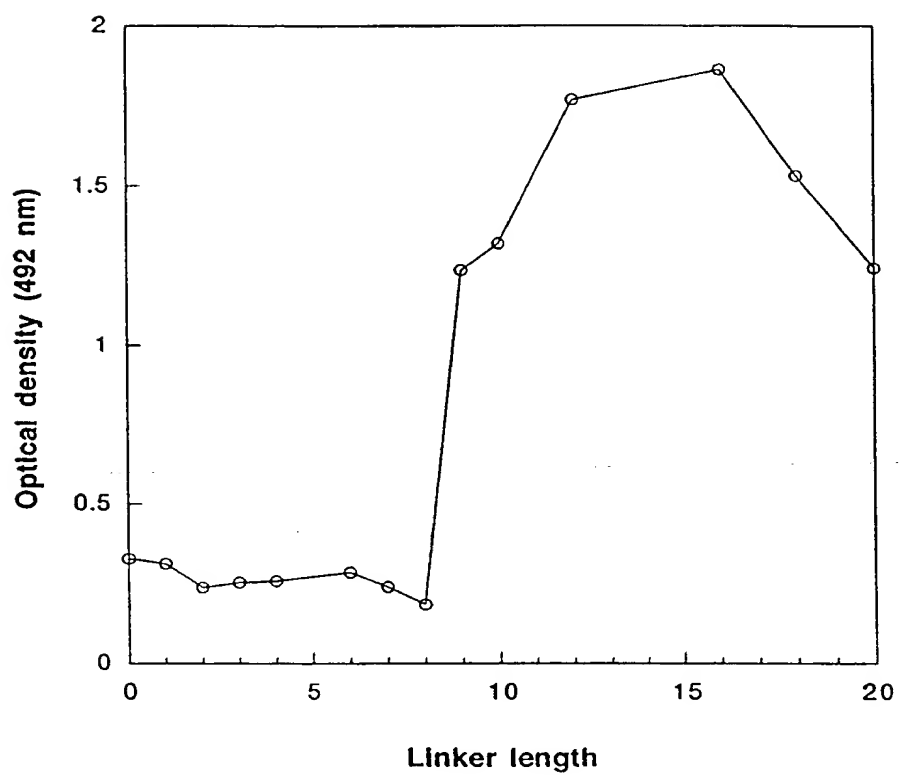


Figure 13

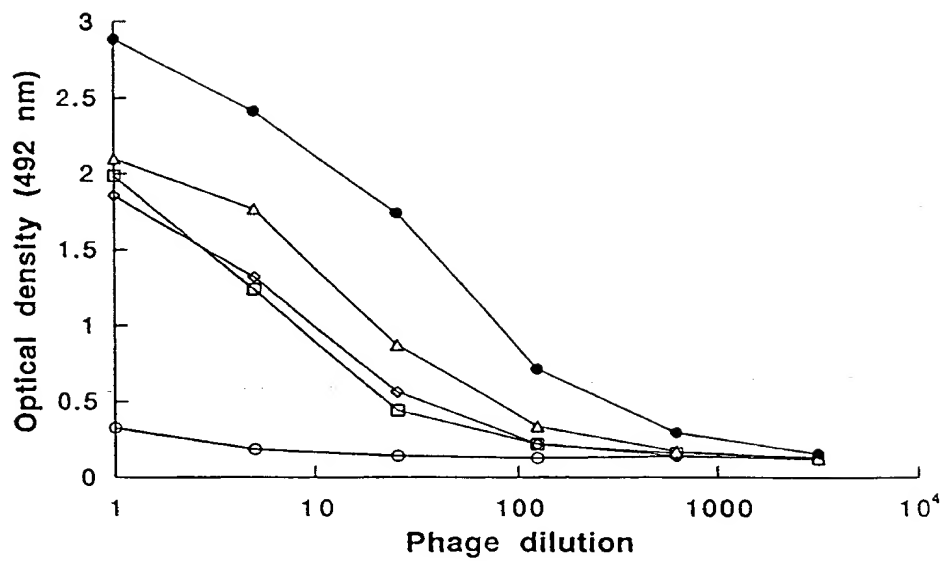


Figure 14

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	NWT (SEQ ID NO. 206)
L	NWT	NKT	NWT	NYT	NYT	NKT	NWT	NWT	NWT	NWT	NWT	NKG	NYT	NKG	NYT	NWC	NKT	NWT	NWT	F
I	F	F	F	F	F	F	F	F	F	F	F	L	F	L	F	F	F	F	F	F
B	L	L	L	L	L	L	L	L	L	L	L	M	L	M	L	L	L	L	L	L
R	I	I	I	I	I	I	I	I	I	I	I	V	I	V	I	I	I	I	I	I
R	V	V	V	V	V	V	V	V	V	V	V	W	V	W	V	V	V	V	V	V
A	N	C	N	S	S	C	N	N	N	N	N	R	S	R	S	Y	C	N	N	N
R	H	R	H	P	P	R	H	H	H	H	H	G	P	G	P	H	R	H	H	H
Y	N	S	N	T	T	S	N	N	N	N	N	T	T	T	T	N	S	N	N	N
	D	G	D	A	A	G	D	D	D	D	D	A	A		A	D	G	D	D	D
P12-1	GTT	TTT	GTT	TTT	TCT	GTT	GAT	GTT	GAT	AAT	AAT	TGG	ATT	TGG	GCT	GTC	GGT	ATT	GTT	SEQ ID NO. 267
	V	F	V	F	S	V	D	V	D	N	N	W	I	W	A	V	G	I	V	SEQ ID NO. 268
P12-2	CAT	AGT	CTT	GCT	GTT	ATT	GAT	GAT	AAT	TTT	TAT	TGG	GTT	GGG	TTT	TAC	GGT	TAT	GTT	SEQ ID NO. 269
	H	S	L	A	V	I	D	D	N	F	Y	W	V	G	F	Y	G	Y	Y	SEQ ID NO. 270
P12-3	CTT	TTT	TAT	CCT	GTT	AGT	GTT	CAT	ATT	GTT	ATT	CGG	TTT	TTG	TCT	CTC	TTT	CTT	GTT	SEQ ID NO. 271
	L	F	Y	P	V	S	V	H	I	V	I	R	F	L	S	L	F	L	V	SEQ ID NO. 272
P12-4	CTT	AGT	GTT	GTT	GTT	CGT	GAT	CTT	ATT	TAT	AAT	GTG	GTT	ATG	TTT	CAC	GTT	GTT	AAT	SEQ ID NO. 273
	L	S	V	V	V	R	D	L	I	Y	N	V	V	M	F	H	V	V	N	SEQ ID NO. 274
P12-5	CTT	GGT	TTT	TCT	ACT	CGT	GTT	CTT	GTT	GAT	GAT	TGG	CTT	ATG	GTT	AAC	AGT	TTT	GAT	SEQ ID NO. 275
	L	G	F	S	T	R	V	L	V	D	D	W	L	M	V	N	S	F	F	SEQ ID NO. 276
P12-6	TAT	TTT	CTT	GCT	TTT	AGT	ATT	ATT	GAT	CTT	TTT	AGG	CTT	TGG	CTT	TAC	TTT	GTT	AAT	SEQ ID NO. 277
	Y	F	L	A	F	S	I	I	D	L	F	R	L	W	L	Y	F	V	V	SEQ ID NO. 278

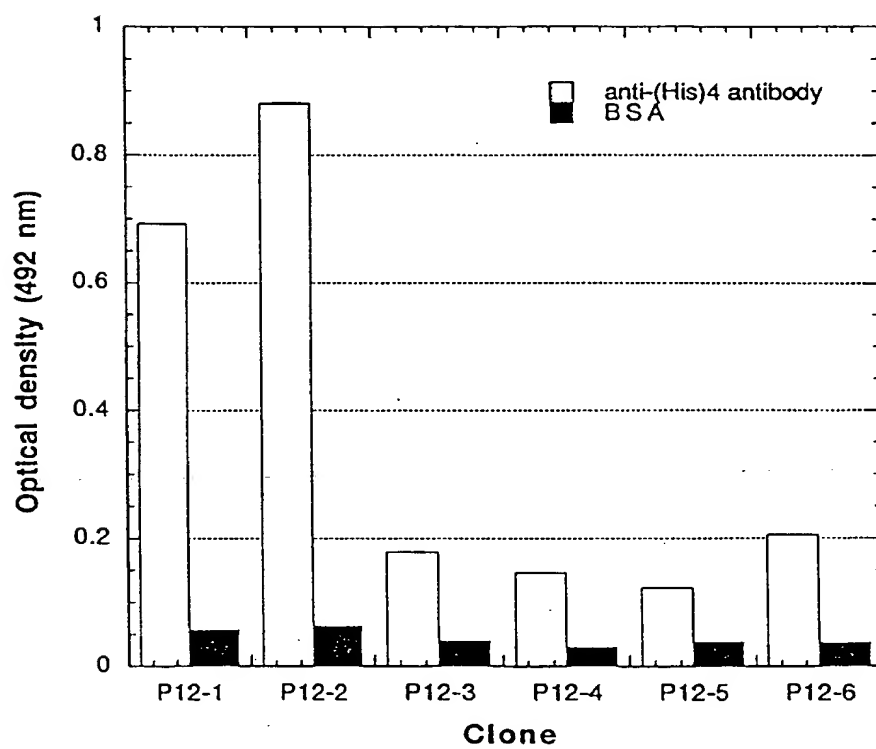


Figure 16



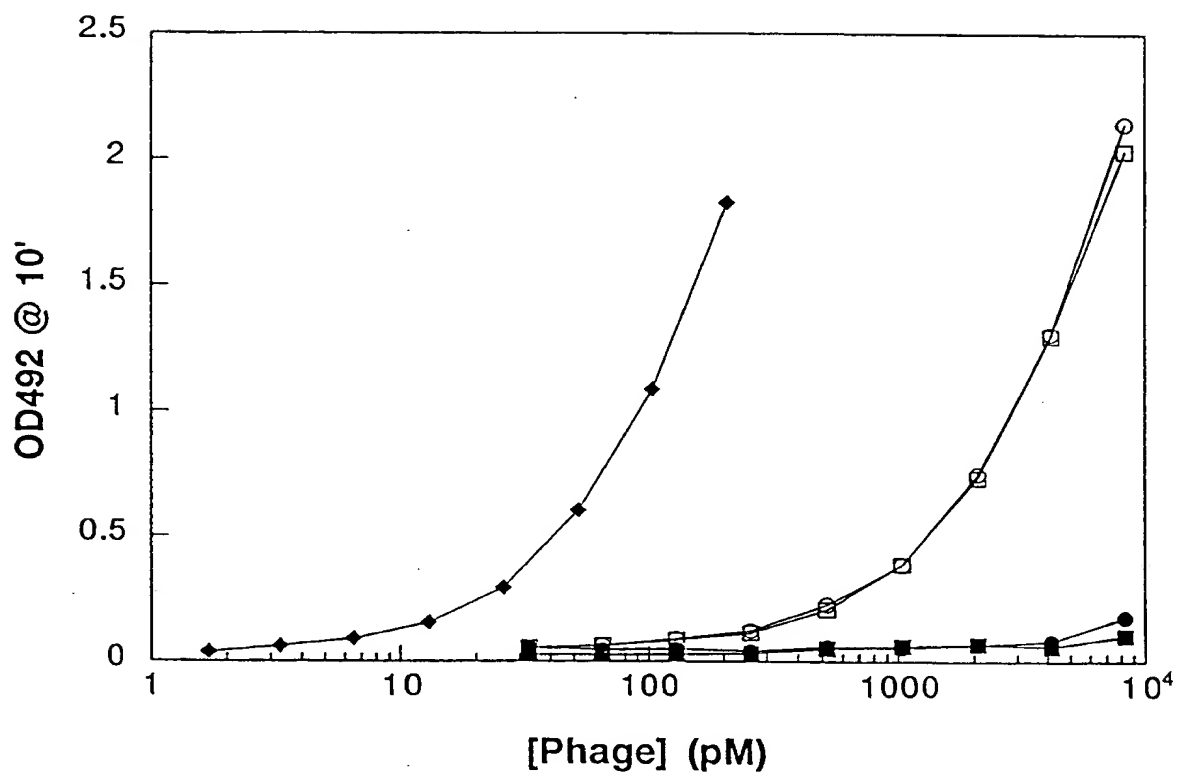


Figure 17

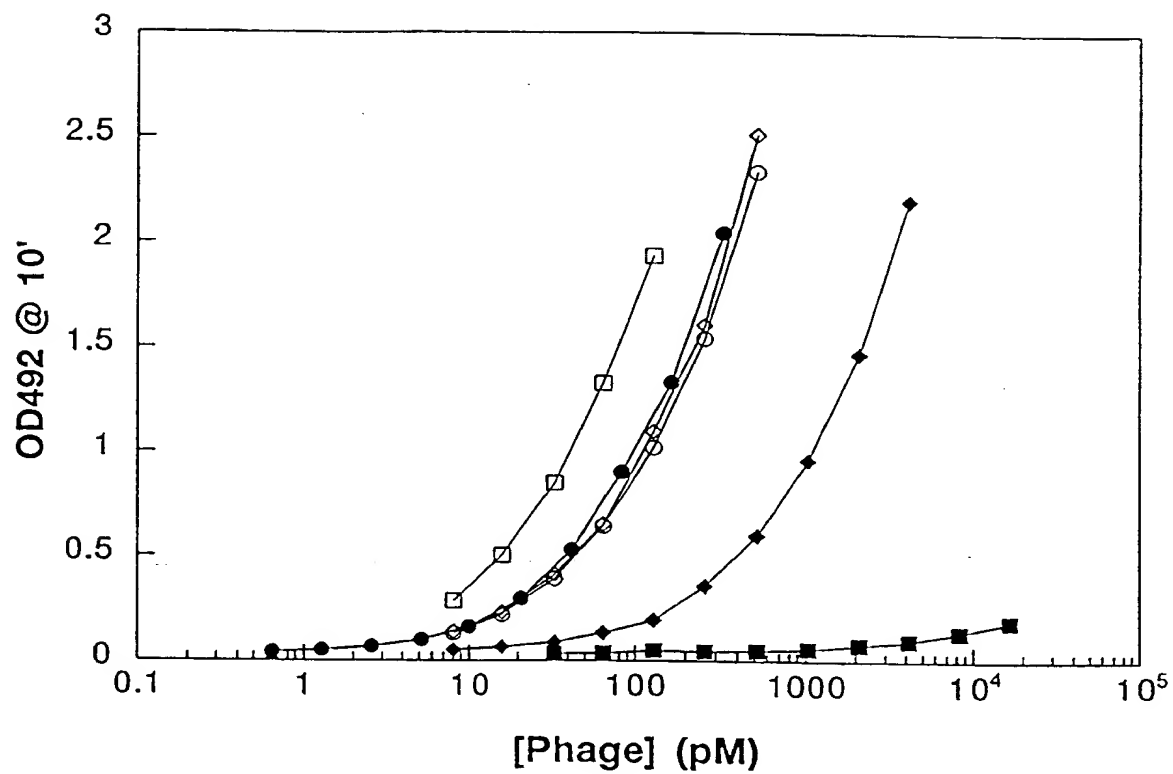


Figure 18